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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MAY GRIFFITH, DAVID J. CARLSSON, FENGFU LI, YUWEN LIU, J. CHRISTOPHER MARMO, and MEHRDAD ASMANRAFAT[1]

Appeal 2015-005662
Application 11/203,685
Technology Center 3700

Before BRADLEY R. GARRIS, GEORGE C. BEST, and MICHAEL G. McMANUS, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134, Appellants appeal from the Examiner's rejections under 35 U.S.C. § 103(a) of independent claims 9 and 45 as unpatentable over Bruns (US 4,581,030, issued Apr. 8, 1986) in view of Dapper (US 5,487,895, issued Jan. 30, 1996) and Nigam (US 2002/0107566 A1, published Aug. 8, 2002) and of remaining dependent claims 10, 12, 14,

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[1] The Ottawa Health Research Institute, National Research Council of Canada, and Forsight Labs, LLC are identified as the real parties in interest. Br. 2.

15, 17, 19–23, 25–28, 30–33, 35, 36, 47–49, 51 and 53–58 as unpatentable over these references alone or in combination with additional prior art. We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM.

Appellants claim a vision enhancing ophthalmic device comprising collagen crosslinked with amide bonds (independent claim 9) as well as a corneal onlay comprising collagen having zero-length bond crosslinking (independent claim 45).

A copy of representative claim 9, taken from the Claims Appendix of the Appeal Brief, appears below.

> 9. A vision enhancing ophthalmic device formed to have an optical power, wherein the device comprises between about 5% (w/w) and about 50% (w/w) collagen and is obtained by a process comprising
>
> a) providing an aqueous solution comprising collagen;
>
> b) cross-linking the collagen with amide bonds; and then
>
> c) curing the cross-linked collagen in a mould;
>
> thereby forming an ophthalmic device sized and shaped with corrective curvature and having optical clarity and tensile strength suitable for enhancing vision by implantation in or around the cornea of an eye.

Appellants' arguments are focused on the amide bond crosslinking requirement of the independent claims and repeatedly refer to claim 9 specifically (Br. 4–10). Appellants do not present separate arguments specifically directed to the dependent claims (*id.*). Therefore, the dependent claims will stand or fall with their parent independent claims, of which claim 9 is representative.

We will sustain the Examiner's § 103 rejections for the reasons expressed in the Final Action, the Answer, and below.

The Examiner finds that Bruns fails to disclose the amide bond cross-linking feature of the independent claims (Final Action 3–4) but concludes that it would have been obvious to effect the desired collagen crosslinking of Bruns' corneal prosthesis via amide bonding in view of Dapper (*id.* at 4).[2]

Appellants argue that Dapper is from a non-analogous art (Br. 8–9), stating "[a] person of ordinary skill in the art who wanted to improve a permanent ophthalmic device according to Bruns would not look to [Dapper's] technology that is deliberately constructed to be non-permanent" (*id.* at 9).

There is questionable merit in Appellants' belief that Dapper's technology is deliberately constructed to be non-permanent for the reasons detailed by the Examiner (Ans. 8–9), which reasons are not challenged by Appellants (i.e., no Reply Brief has been filed). Regardless, art is analogous to the claimed invention if it is "reasonably pertinent to the particular problem with which the inventor is involved." *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Appellants are involved with the problem of cross-linking collagen (Spec. 19–20). The Dapper reference is reasonably pertinent to this problem because the reference discloses crosslinking collagen (Dapper col. 1, ll. 23–36 (cited, e.g., at Final Action 4 and Ans. 9)) using EDC (Dapper col. 4, ll. 6–11, col. 5, ll. 5–12, col. 6, ll. 26–31, 55–63 (cited, e.g., at Final Action 4 and Ans. 9–11)) which produces the claimed amide bond crosslinking according to Appellants' Specification (Spec. 19–20).

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[2] Because Appellants do not contest the Examiner's proposed combination of Bruns and Nigam (*see* Br. 4–10), we will not address this aspect of the rejection.

Appellants also contend that "a person of ordinary skill in [] reading Dapper would not have a reasonable expectation that zero-length cross-linking could lead to an ophthalmic device of any permanence" (Br. 9).

Appellants provide no evidence in support of this contention. On the other hand, Bruns expressly teaches "chemically crosslinking the [collagen] gel . . . with a fixing agent, many of which are known, such as a solution of formaldehyde and/or glutaraldehyde[;] [h]owever, any other well-known method for fixing the gel is suitable" (Bruns col. 3, ll. 26–33 (cited, e.g., at Final Action 3 and Ans. 10)).[3] This express teaching in combination with Dapper provides a reasonable expectation that Bruns' desired crosslinking of collagen would be successfully achieved using the known EDC agent for crosslinking collagen disclosed by Dapper.

Appellants also contest the rejection by stating that Dapper's collagen substrate provides controlled release of bioactive agents by crosslinking collagen only at or near the surface whereas an ophthalmic device of the type claimed would be crosslinked throughout (Br. 7–8).

However, Appellants to not explain why these aspects of Dapper's invention undermine the Examiner's proposed combination of Bruns and Dapper. In this regard, we emphasize that the Examiner proposes using the EDC crosslinking agent of Dapper to achieve the crosslinking desired for Bruns' corneal prosthesis (i.e., an ophthalmic device of the type claimed by Appellants). Contrary to Appellants' implication, the Examiner does not

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[3] We observe that Appellants, similar to Bruns, disclose crosslinking collagen "using any smaller polymeric, collagen-reactive agent or molecule" (Spec. 19:19–20) including glutaraldehyde (*id.* at 20:13–14).

propose modifying the corneal prosthesis of Bruns so as to possess the controlled-release and limited-crosslinking features of Dapper.

Finally, Appellants argue "[u]nexpected benefits are shown for this invention right in the specification as filed" (Br. 10). According to Appellants, "[c]ontrary to what would be expected from the prior art, this application demonstrates that zero-length bonds between collagen fibers are possible and effective in manufacturing an ophthalmic device" (*id.*).

The deficiency of this argument is that Appellants do not identify any evidence showing the subject matter defined by the independent claims possesses benefits that would not have been expected by one with ordinary skill in this art. For example, and as previously indicated, Appellants proffer no evidence that the EDC crosslinker of Dapper would not have been expected by those skilled in this art to achieve the crosslinking desired for Bruns' corneal prosthesis.

For the reasons stated above and given by the Examiner, we sustain the § 103 rejections advanced in this appeal.

The decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED